

NEW SPECIES OF *ACACIMENUS* DLABOLA (HEMIPTERA: CICADELLIDAE: DELTOCEPHALINAE) FROM INDIA AND SRI LANKA¹

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(With thirty-one text-figures)

Key words: *Acacimenus* Dlabola, Cicadellidae, new species, India, Sri Lanka.

Genus *Acacimenus* Dlabola has been recorded for the first time from the Oriental region. Five new species of this genus, namely *Acacimenus deccanensis* sp. nov., *A. maheshai* sp. nov., *A. inequalis* sp. nov., *A. variabilis* sp. nov. (all from India) and *A. zeylonicus* sp. nov. (from Sri Lanka) are described and illustrated. Their relationships with *A. makranus* Dlabola, the type species of the genus from the Palaearctic region, are discussed. A key to the species of this genus is also provided.

INTRODUCTION

Dlabola (1979) described the genus *Acacimenus* from specimens collected from Iran, Saudi Arabia and Baluchistan, feeding on a species of *Acacia* (Fabaceae) with *Acacimenus makranus* Dlabola as the type species. The forewing of this species is similar to that of *Hishimonus* Ishihara, and vertex similar to that of *Neotalitrus* Distant and *Opsius* Fieber.

During field trips in India for the survey of leafhoppers associated with sandal forests (Subba Rao *et al.*, 1988), the author discovered a number of specimens resembling species of *Orosius* Distant in coloration breeding on species of *Acacia* (especially *A. leucophloea*). On closer examination, they were found to represent four new species of *Acacimenus*. Another new species of this genus from Sri Lanka was also discovered from the collections of the U.S. National Museum of Natural History, Washington, D.C. All five of these species are described here as new to science.

The holotypes of the new taxa (except *A. zeylonicus*) have been deposited in the University of Agricultural Sciences, GKVK, Bangalore (UAS). The paratypes are to be deposited in the Natural History Museum, London, U.K.

(BMNH), National Pusa Collection, Indian Agricultural Research Institute, New Delhi (NPC) and the U.S. National Museum of Natural History, Washington D.C. (USNM).

Genus *Acacimenus* Dlabola

Acacimenus Dlabola, 1979; 137. Type species: *Acacimenus makranus* Dlabola, by original designation.

In general, all species of *Acacimenus* are very distinctly coloured with brown irroration on ivory background; second antennal segment chocolate brown; legs with broad (but variable) brown to chocolate brown patches, the patch on apex of hind tibia always consistent; coloration often similar to that of the various species of *Orosius*; forewings with a medial discal spot as in *Hishimonus* and *Naevus* Knight; head, thorax and scutellum shagreened; vertex slightly more elongated medially than next to eyes, anteriorly rounded to face; ocelli placed at a distance equal to their own diameter from adjacent eye; a cross vein between claval veins and between outer claval vein and claval suture; inner anteapical cell closed behind.

Male pygofer with caudal margin concavely excavated dorsally, with more anterior margin produced into a sclerotized knob, the caudal point rounded; subgenital plates triangular with an oblique row of setae; connective Y-shaped with bifid stem; style robust

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with claw-like apophysis having sculptured surface; aedeagus with a well developed, often plate-like dorsal apodeme, shaft with apical and subapical processes variously branched; gonopore apical. Seventh sternum of female rectangular with the hind margin produced into a small lobe posteriorly.

Remarks: Though *Acacimenes* resembles some of the genera of the tribe Opsiini such as *Hishimonus*, *Neocaliturus*, *Opsius* and *Orosius*, it can be readily recognised by its single aedeagal shaft while all others have paired shafts.

Pruthi (1934) described *Orosius santali* Pruthi from a sandal forest in south India (Tamil Nadu: North Salem, Jawalagiri) which in the author's opinion also belongs to this genus. However, the type specimens of the species are missing from the Zoological Survey of India collection and hence it is difficult to recognise this species.

1. *Acacimenes maheshai* sp. nov.

(Fig. 1-6)

Coloration as in *A. makranus*, but darker; mesal border of gena near lorum whitish.

Male genitalia: Pygofer with dorsal margin produced into a short, digitate process, caudal margin dorsally concave, ventral margin slightly convex; long setae dorsally confined to the caudal region, ventral area uniformly clothed with microsetae; valve triangular, subgenital plate triangular with a series of stout setae arranged in an oblique row, connective and style as in generic diagnosis; aedeagal shaft cylindrical, uniformly curved, with a pair of subapical ventrolaterally directed processes, each process with three rami near its base; gonopore apical; dorsal apodeme half as long as shaft.

Female genitalia: Seventh sternum rectangular with a short, bilobed, median projection on hind margin.

Measurements: Male 3.5 (3.4-3.7) mm long, 1.1 (1.0-1.2) mm wide across eyes. Female 4.1 (3.9-4.4) mm long, 1.3 (1.2-1.4) mm wide across eyes.

Material examined: Holotype: male, INDIA: Karnataka: Sulikere (near Bangalore), 30.xii.1976, Coll. C.A. Viraktamath (UAS). **Paratypes:** INDIA: Karnataka: 1 male, data as in holotype; 3 females, 8 km S. Dharwar, 1.ix.1972, Coll. C.A. Viraktamath; 1 male, 7 km N. Dodballapur, 18.vi.1977, Coll. C.A. Viraktamath; 1 female, 20 km NW Dodballapur, 18.vi.1977, Coll. C.A. Viraktamath; 1 male, 8 km E. Channapatna, 15.vii.1977, Coll. C.A. Viraktamath; 2 males, Bidar, 14.ix.1984, Coll. Shashidhar (BMNH, NPC, UAS, USNM).

Remarks: *A. maheshai* is related to *A. makranus* but differs from it in having branched aedeagal process and cylindrical rather than compressed aedeagal shaft.

Etymology: Named after Lord Shiva.

2. *Acacimenes inequalis* sp. nov.

(Figs. 7-12)

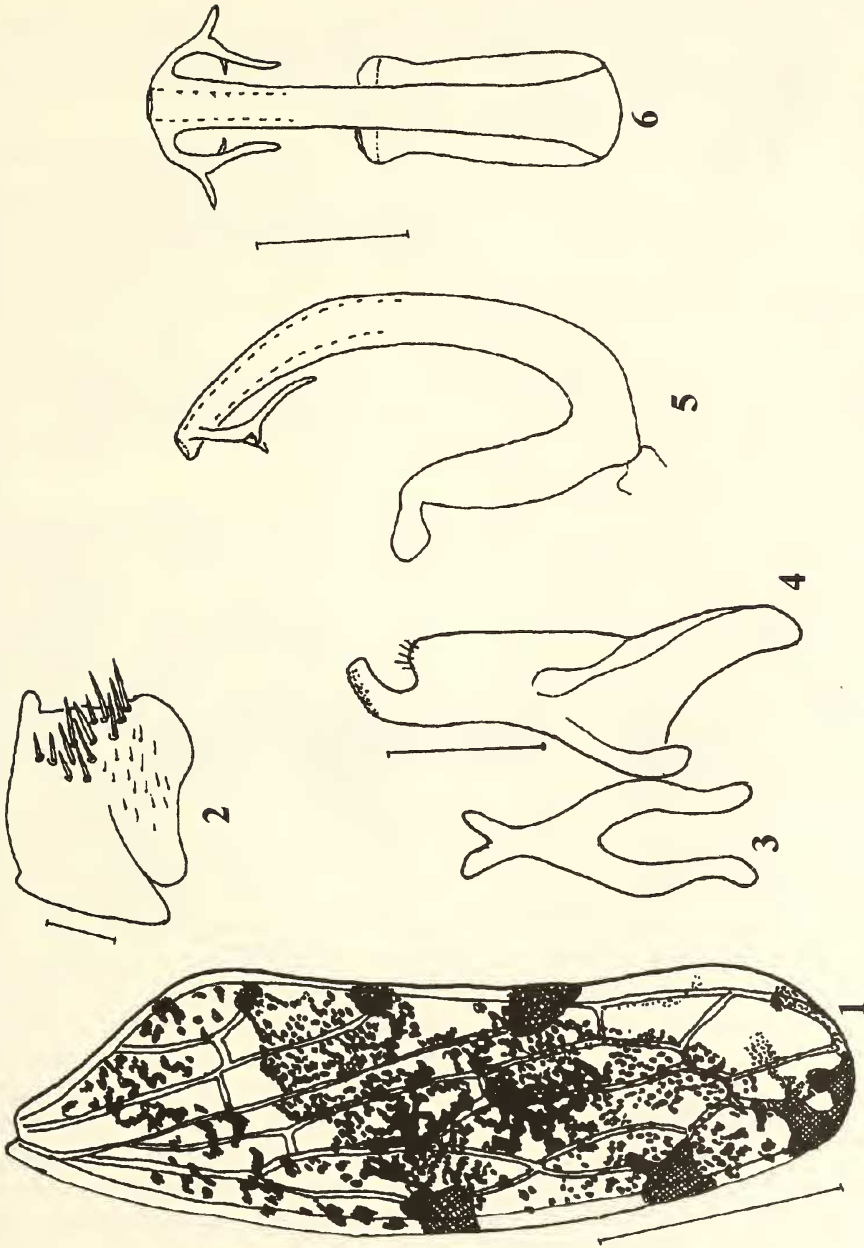
Coloration as in *A. variabilis* sp. nov. but more richly spotted with brown.

Male genitalia: Similar to those in *A. maheshai*. Body of style with a strong lateral excavation at the middle (arrowed in Fig. 9); aedeagal shaft with a pair of short prong-like processes at the anterior margin and with a pair of longer, forked lateral processes; dorsal apodeme slightly less than 0.5 times as long as shaft.

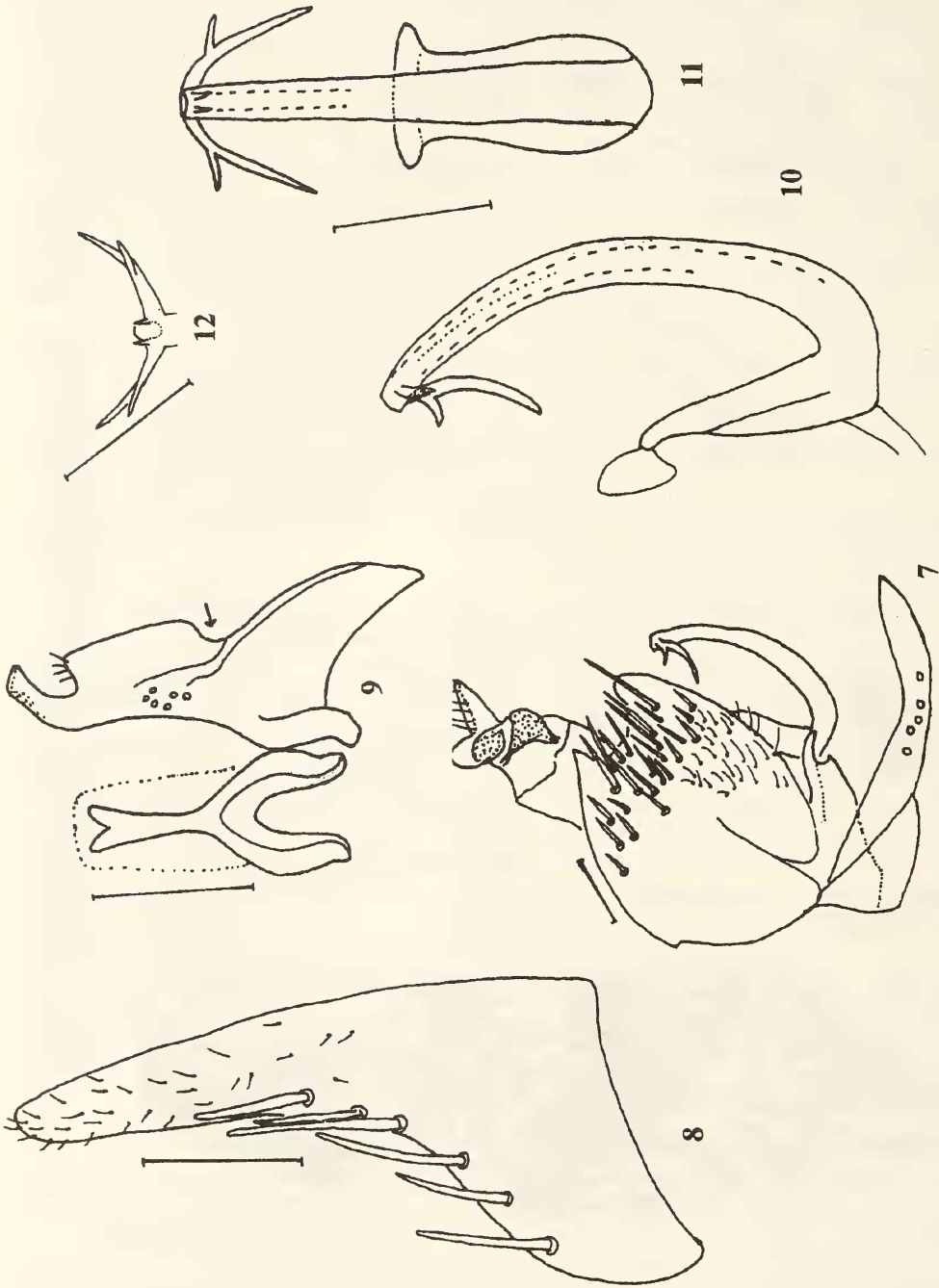
Measurements: Male 3.3 mm long, 1.1 mm wide across eyes. Female 3.8 mm long, 1.1-1.2 mm wide across eyes.

Material examined: Holotype: male, INDIA: Gujarat: Ahmedabad, 27.i.1981, Coll. C.A. Viraktamath (UAS). **Paratypes:** 2 males and 3 females, data as for holotype (BMNH, NPC, UAS, USNM).

Remarks: This species can be recognised at once by the pair of prong-like processes on the anterior margin of the aedeagal shaft. It is related to *A. maheshai* and *A. variabilis*, and differs from both of them in the manner of branching of the processes of the aedeagal shaft.



Figs. 1-6: *Acacimetus maheshai* sp. nov.: 1. Forewing, lateral view; 2. Pygofer, lateral view; 3. Connective; 4. Style; 5. Aedeagus, lateral view; 6. Aedeagus, caudal view. Scale line in Fig 1 = 1 mm; Figs. 2-6 = 0.1 mm



Figs. 7-12: *Acacimenus inequalis* sp. nov.: 7. Male genitalia, lateral view; 8. Subgenital plate; 9. Connective and style; 10. Aedeagus, lateral view; 11. Aedeagus caudal view; 12. Apex of aedeagal shaft, ventral view. Scale line equals 0.1 mm.

Etymology: The species name alludes to the unequal processes of the aedeagal shaft.

3. *Acacimenus variabilis* sp. nov. (Figs. 13-21)

Coloration similar to that of *A. maheshai* but paler; brown markings on forewing less extensive.

Male genitalia: Similar to that in *A. maheshai*; aedeagus more robust, process of aedeagal shaft with a basal fork, the shorter being unbranched and the longer process variably branched.

Female genitalia: Similar to that of *A. maheshai*.

Measurements: Male 3.9 (3.8-4.0) mm long, 1.2 (1.1-1.2) wide across eyes. Female 4.2 (3.8-4.6) mm long, 1.3 (1.2-1.4) mm wide across eyes.

Material examined: Holotype: male, INDIA: Karnataka: Bangalore, 916 m, GKVK, 30.iv.1976, Coll. C.A. Viraktamath, ex. Sandal (UAS). **Paratypes:** INDIA: Karnataka: 1 male data as in holotype; 4 males, 4 females, data as in holotype but collected on 15.x.1978; 1 female, Bidadi, 28.x.1976, Coll. B. Mallik; 1 female, Chikballapur, 17.iii.1977; 1 male, 5 km S. Kolar, 12.iv.1977; 1 male, Devanahalli, 9.vi.1977; 2 males, 2 females, 7 km N. Dodballapur, 18.vi.1977; 1 female, 8 km E. Channapatna, 15.vii.1977; 1 male, Kollegal, 8.viii.1977; 1 male, 18 km E. Chamaraajanagar, 13.viii.1977; 1 male, Hubli, 16.xi.1977; 4 males, 2 females, 10 km N. Hunsur, 16.i.1978; 1 female, 10 km N. Nagarhole, 16.i.1978, all collected by C.A. Viraktamath (BMNH, NPC, UAS, USNM). Other material: 1 female, 8 km S. Dharwar, Navalur Hill, 1.ix.1972; 1 female, Dharwar, x.1969, at light, Coll. C.A. Viraktamath (UAS).

Remarks: *A. variabilis* is the palest among the species of *Acacimenus* and has highly variable branched processes of the aedeagal shaft. It is closely related to *A. maheshai* and *A. inequalis* in having similar cylindrical aedeagal shaft, but can be differentiated by the aedeagal shaft process which is branched at the base

instead of a short distance away from the base as in *A. maheshai*. From *A. inequalis* it is distinguished by the absence of short projections on anterior margin of aedeagal shaft near apex, which are present in *A. inequalis*.

Etymology: The species name alludes to the variable nature of branching of the aedeagal processes.

4. *Acacimenus deccanensis* sp. nov.

(Figs. 22-24)

Coloration similar to that of *A. maheshai*, but the forewing has more numerous dark brown spots.

Male genitalia: Similar to that of *A. maheshai*. Aedeagus compressed along the distal half, in lateral view broadest near apex, shaft with two pairs of processes, more apical process directed antero-laterally, robust, entire except bifid apex, more basal process slender, deeply forked, more dorsal process longer than the ventral one.

Measurements: Male 3.4 mm long, 1.1 mm wide across eyes.

Material examined: Holotype: male, INDIA: Karnataka: Gulbarga, 25.xi.1981, Coll. A.R.V. Kumar (UAS).

Remarks: Considering the compressed aedeagal shaft, *A. deccanensis* appears to be related to *A. makranus*, but differs from it in having two pairs of aedeagal processes. It, however, appears to be more closely related to *A. zeylonicus* than to *A. makranus*.

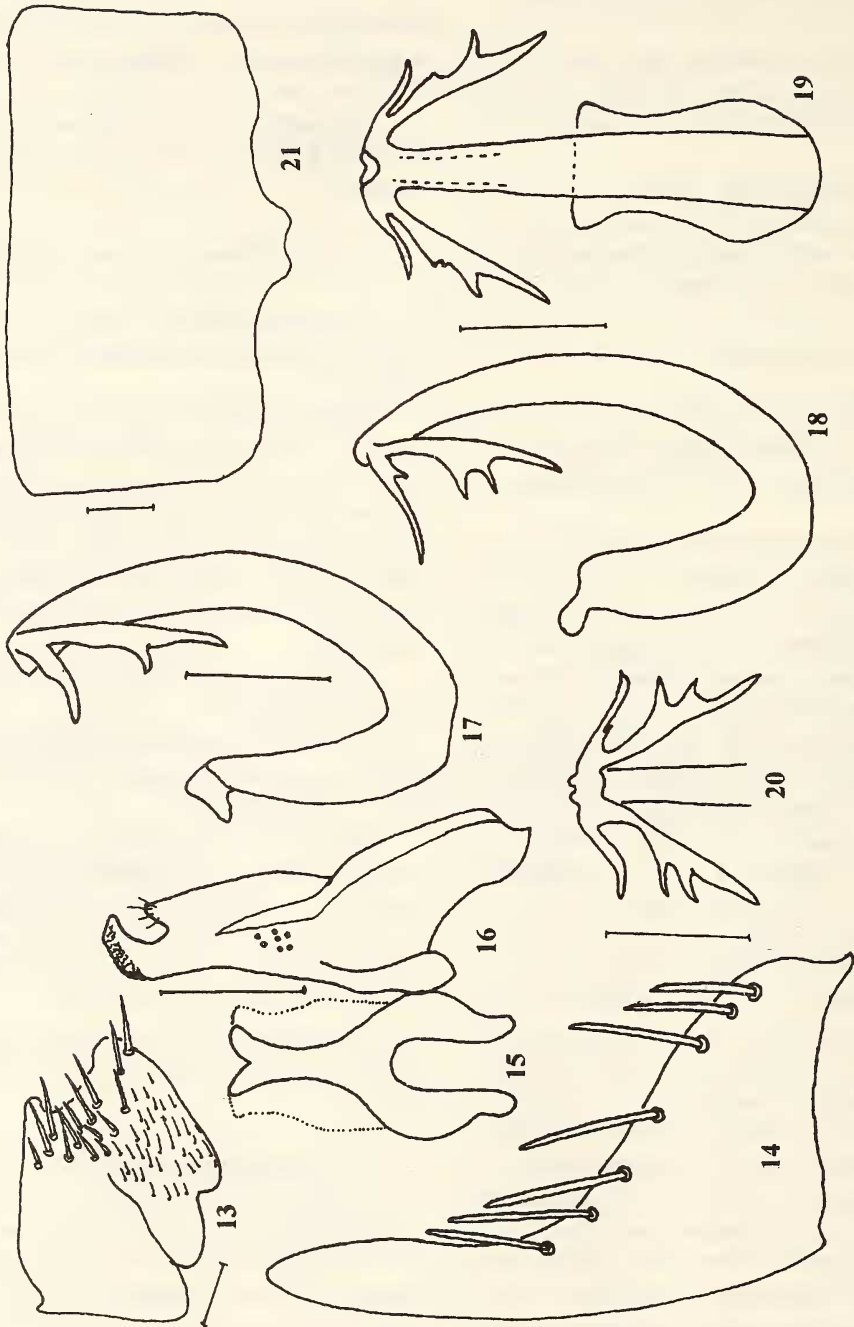
Etymology: The species name alludes to the type locality i.e. Deccan plateau of peninsular India.

5. *Acacimenus zeylonicus* sp. nov.

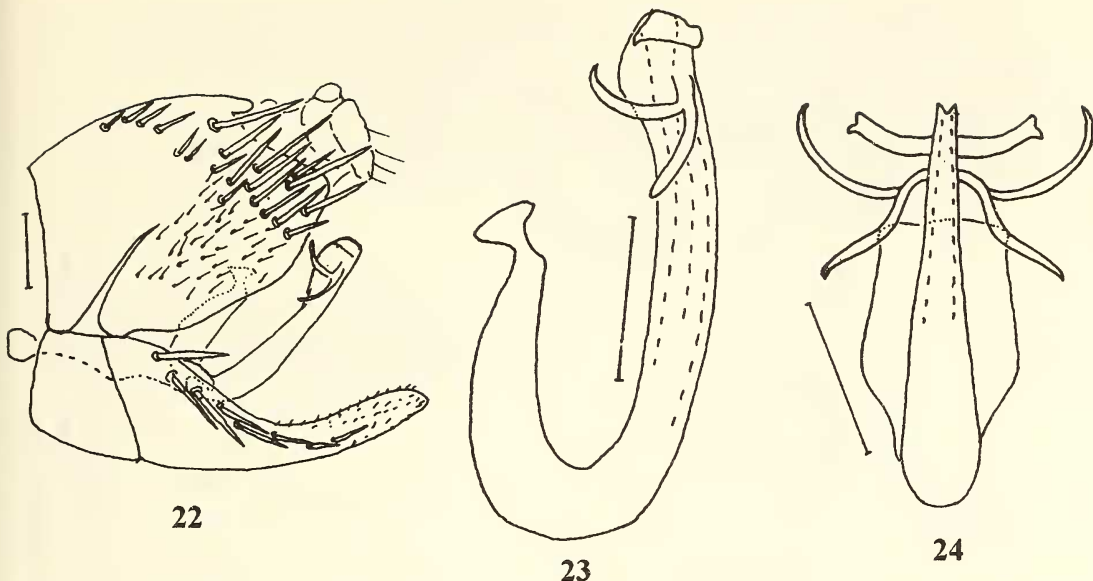
(Fig. 25-31)

Coloration as in *A. makranus* but paler.

Male genitalia: Male genitalia similar to that of *A. maheshai*. Apophysis of style digitate, much less curved than in any of the Indian species; stem of the connective broader, caudal margin entire; aedeagal shaft widest at the middle



Figs. 13-21: *Acacimenus variabilis* sp. nov.: 13. Pygofer; 14. Subgenital plate; 15. Connective; 16. Style; 17, 18. Variation in the Aedeagus, lateral aspect; 19. Aedeagus, caudal view; 20. Apex of aedeagus, caudal view; 21. Female seventh sternum. Scale line equals 0.1 mm.



Figs. 22-24: *Acacimenus deccanensis* sp. nov.: 22. Male genitalia, lateral view; 23. Aedeagus, lateral view; 24. Aedeagus caudal view. Scale line equals 0.1 mm.

with two pairs of processes, one apically forked pair arising near apex and the second unforked pair arising at 0.6 length of the shaft.

Female genitalia: Seventh sternum rectangular, with the hind margin having a median semicircular lobe.

Measurements: Male 3.5 (3.4-3.6) mm long, 1.2 mm wide across eyes. Female 3.8 mm long, 1.2 mm wide across eyes.

Material examined: Holotype: male, Sri Lanka: Anu. Dist., Hunuwilagama, 28 Oct.-3 Nov. 1976, Coll. G.F. Havel, R.E. Dietz IV, S. Karunaratne, D.W. Balasooriya (USNM). **Paratypes:** 4 males, 1 female, data as for holotype (USNM).

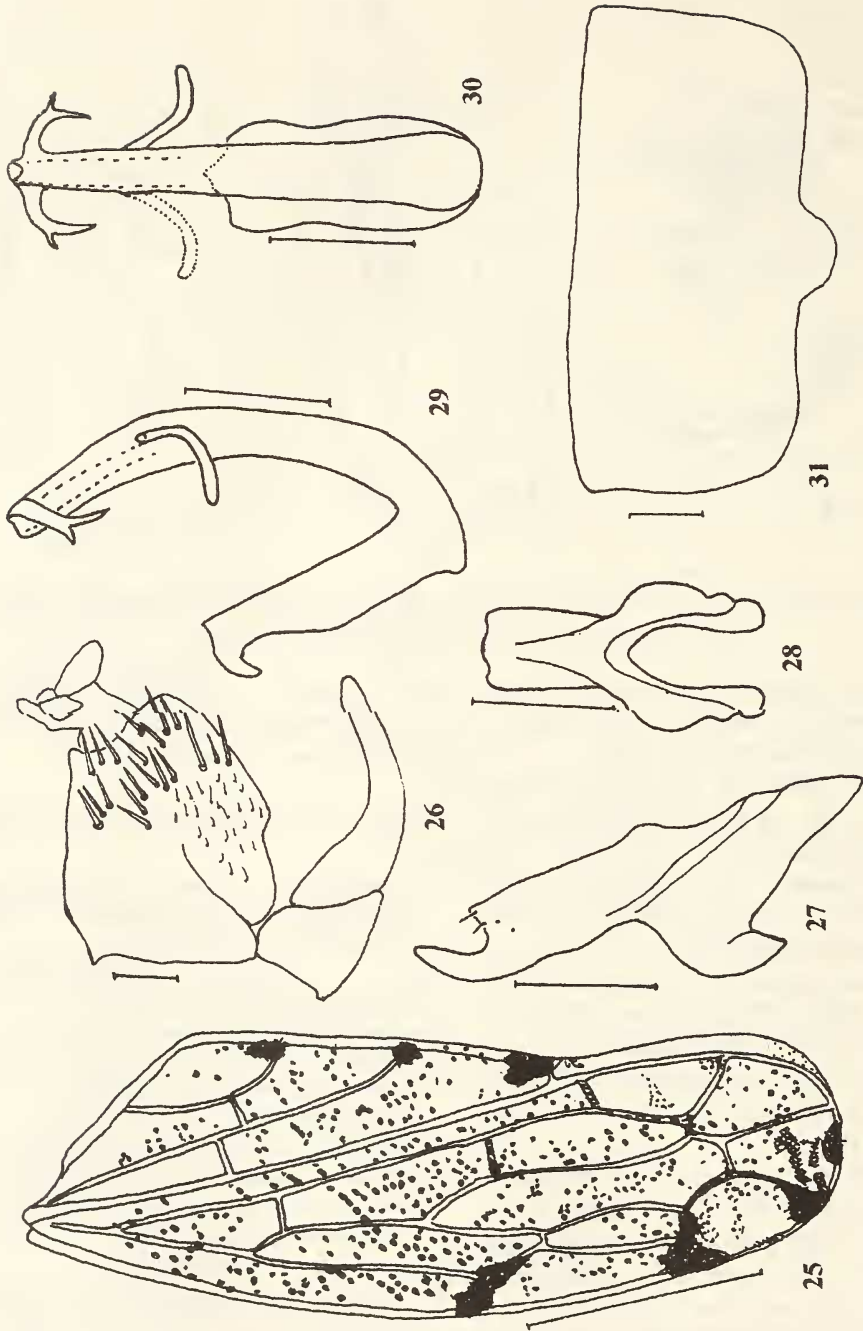
Remarks: *A. zeylonicus* is not closely related to any of the known species of *Acacimenus*. It differs from the Indian species by the shape of the apophysis of the style, connective, the more basal process of the aedeagus arising at 0.6 distance from the base of the shaft and the median lobe-like projection on hind margin of the female seventh sternum being rounded rather than bilobed as in *A. maheshai*

and *A. inequalis*.

Etymology: From the country (Ceylon) where the type was collected.

KEY TO THE SPECIES OF *Acacimenus* Dlabola

1. Aedeagus with a pair of short projections on anterior margin of shaft near apex, in addition to long processes (Figs. 10, 11) *A. inequalis* sp. nov.
- Aedeagus not as above 2
2. Aedeagus with one pair of processes to shaft (Figs. 5, 6, 17, 18) 3
- Aedeagus with two pairs of processes (Figs. 23, 24, 29, 30) 5
3. Processes of aedeagus almost 0.75 as long as shaft, unbranched, with a triangular expansion on the distal half *A. makranus* Dlabola
- Process of aedeagus less than 0.5 as long as shaft, variously branched (Figs. 6, 19) 4
4. Aedeagal shaft process forked at base, longer fork in turn variously branched (Figs. 17-20) *A. variabilis* sp. nov.
- Aedeagal shaft process forked a short distance away from base, with three forks (Figs. 5-6) *A. maheshai* sp. nov.



Figs. 25-31: *Acacimenes zeylonicus* sp. nov.: 25. Fore wing; 26. Male pygofer, valve and subgenital plate, lateral view; 27. Style; 28. Connective; 29. Aedeagus, lateral view; 30. Aedeagus, lateral view; 31. Female seventh sternum. Scale line in Fig. 25 equals 1 mm, in Figs. 26-31 equals 0.1 mm.

NEW DESCRIPTIONS

5. Aedeagal shaft processes arising close together, more basal process forked (Figs. 23, 24).....
..... *A. deccanensis* sp. nov.
- Aedeagal shaft processes wide apart; more basal process unbranched (Figs. 29-30).....
..... *zeylonicus* sp. nov.

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REFERENCES

- DLABOLA, J. (1979): Insects of Saudi Arabia, Homoptera. *Fauna of Saudi Arabia, 1*: 115-139.
- PRUTHI, H.S. (1934): Entomological investigations on the disease of sandal (14) Jassidae (Homopt). *Indian Forest Rec. (Ent. Ser.) 19(16)*: 1-30.
- SUBBA RAO, M., C.A. VIRAKTAMATH & V. MUNIYAPPA (1988): Incidence of leafhoppers, treehoppers and froghopper (Homoptera) in sandal forests of Karnataka in relation to sandal spike disease. *Ann. Entomol. 6(2)*: 25-34.

